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ADDITIONAL NOTES ON THE DISTRIBUTION
AND FOODPLANT PREFERENCES OF
MEGATHYMUS COLORADENSIS NAVAJO
SKINNER (MEGATHYMIDAE)

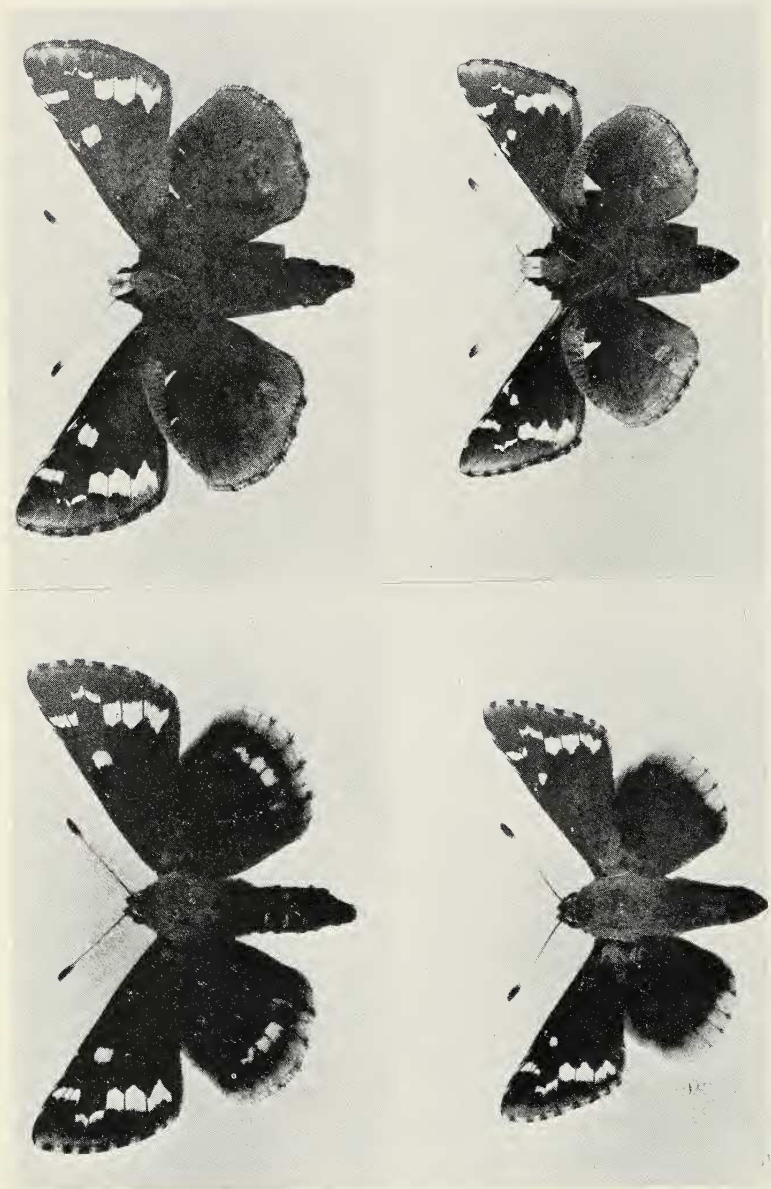
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FOR THE PAST SEVERAL YEARS we have been engaged in the collecting of *Megathymus* larvae and pupae from *Yucca* colonies in central Arizona, subsequently securing a long series of adults from all localities. When we attempted to determine these using the key in the review of the family by Freeman (1969) some difficulty was encountered. The specimens were keyed tentatively to *Megathymus coloradensis navajo* Skinner only after considerable effort. However, a comparison of the specimens with the figures of *navajo* given in the plate in *Colorado Butterflies* (Brown, Eff and Rotger, 1957) revealed distinct differences, especially in the females. We hesitantly proceeded in the direction of a possible description of the central Arizona population pending receipt of more conclusive evidence.

A review of the literature treating the distribution and food-plant records of *navajo* was made. Aside from the rather scanty data available in Freeman (1969) and Brown, Eff and Rotger (1957) we could find little to support the possibility of the central Arizona population as being consubspecific with *navajo*. Indeed, the fact that the type locality for *navajo* is Fort Wingate, McKinley County, New Mexico (Skinner, 1911) only seemed to increase the possibility of the central Arizona population as being a distinct subspecies. This possibility was dispelled, however, when a comparison was made between examples of the central Arizona population and male specimens of *navajo* on loan from the American Museum of Natural History.

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Male and female phenotypes characteristic of the central Arizona population of navajo. Top row: Female $\frac{1}{2}$ - $1\frac{1}{2}$ miles north of Camp Creek, Maricopa County, Arizona, 18 II 1971; left, upperside; right, underside. Bottom row: Male, $\frac{1}{2}$ - $1\frac{1}{2}$ miles north of Camp Creek, Maricopa County, Arizona, 22 II 1971; left, upperside; right, underside.

In the short series of *navajo* received was a male specimen collected in Globe, Arizona, May 24, 1933 (collector unknown) determined by H. A. Freeman. In locality cited and morphological characteristics this specimen corresponded well with our series of males from that area. It is on the basis of this one specimen that we unhesitatingly assign the central Arizona population of *Megathymus* to *navajo*. Our collecting records of *navajo* from central Arizona total a series of 243 specimens (130 males and 113 females) all ex larvae and pupae emerging in confinement from March 1968 to March 1971, collected from the following localities:

52 males and 48 females, reared from *Yucca baccata* Torrey found $\frac{1}{2}$ - $1\frac{1}{2}$ miles north of Camp Creek, Maricopa County, Arizona, 3500-3600 feet elevation, emerging from March 1968 to March 1971, R., D. & J. Wielgus, collectors.

6 males and 1 female, reared from *Y. baccata* found 4.3 miles southwest of intersection of Kellner and Icehouse Canyon Roads, Pinal Peak, Gila County, Arizona, 4600-4800 feet elevation, emerging from February 1970 to February 1971, R. & J. Wielgus, collectors.

2 males reared from *Y. baccata* and *Yucca elata* Engelmann found east of Russell Gulch, 2 miles south of Miami, Gila County, Arizona, emerging February 1971, R. & J. Wielgus, collectors.

29 males and 22 females reared from *Y. baccata* found $\frac{1}{4}$ - $1\frac{1}{2}$ miles east of State Highway 87 on Hughes Corral Road, Maricopa County, Arizona, 2500 feet elevation, emerging from February 1969 to March 1971, R., D. & J. Wielgus, collectors.

31 males and 28 females reared from *Y. baccata* and *Yucca elata* var. *verdiensis* McKelvey found $\frac{1}{2}$ - 2 miles east of State Highway 87 on State Highway 188, Gila County, Arizona, 3000-3200 feet elevation, emerging from February 1970 to March 1971, R., D. & J. Wielgus, collectors.

9 males and 8 females reared from *Yucca baccata* var. *vespertina* McKelvey found on the Storm Ranch, Granite Dells, Yavapai County, Arizona, 5000-5200 feet elevation, emerging from February 1971 to March 1971, R., D. & J. Wielgus, collectors.

1 male and 6 females reared from *Y. baccata* var. *vespertina* found at the north end of Willow Creek Reservoir, Section 11, T14N, R2W, Yavapai County, Arizona, R., D. & J. Wielgus, Collectors.

Foodplants: *Yucca baccata* Torrey, *Yucca Baccata* var. *vespertina* McKelvey, *Yucca elata* Engelman and *Yucca elata* var. *verdiensis* McKelvey.

The 243 specimens of *navajo* collected by the authors will be distributed as follows: 29 males and 22 females to the Allyn Museum of Entomology; 17 males and 17 females to the American Museum of Natural History; 6 males and 7 females to Arizona State University; 2 males and 2 females to the California Academy of Sciences; 33 males and 30 females to the Los Angeles County Museum of Natural History; 12 males and 10 females to Lloyd M. Martin; 10 males and 7 females to the United States National Museum; 12 males and 10 females to Don B. Stallings and 9 males and 8 females to the collection of the senior author.

In view of the difficulty encountered in determining the correct subspecies nomen to assign to the central Arizona popu-

lation through the use of the original description (Skinner, 1911), redescription (Freeman, 1943) and key (Freeman, 1969), we feel that it is necessary that the previous descriptions be expanded to include the following redescription applicable to atypical *navajo* as is found in central Arizona. This redescription is based on the previously mentioned 243 specimens collected by the authors.

Female. Upper surface of primaries: deep black with few yellow-brown hairs near base; slight line of white overscaling from apex along outer margin usually not extending caudad of vein Cu₁; spot 1 (cell spot) squarish; spots 2, 3 and 4 nearly twice as wide as high and equal in size; spot 3 extending slightly inwardly in some specimens; spots 5 and 6 narrow, one-half as wide as high; spot 7 square, slightly shorter than spot 8, toothed inwardly, extending one-half or less distance to cell spot, may or may not reach inner edge of spot 6; spot 8 square, toothed inwardly; spot 9 larger than spot 8, sharply toothed inwardly and notched outwardly; spots 7 and 8 with outer edge in straight line angled inwardly; spots 1, 7, 8 and 9 yellow; spots 5 and 6 very light yellow, spot 5 almost white in some specimens; spots 2, 3 and 4 white; fringes checkered smoke-gray and black.

Under surface of primaries: black, outer margin overscaled with white, all spots of upper surface reappearing; spots 2, 3 and 4 equal in size, white; spot 5 narrow, concave outwardly, white; spot 6 narrow, one-third as wide as high, very light yellow; spots 7, 8 and 9 same size and shape as on upper surface, light yellow; white portion of checkered fringe with light overscaling of black scales.

Upper surface of secondaries: black with very few yellow-brown hairs near base; light yellow spots of discal band, a phantom spot only rarely with two small spots below (spots 10 and 11), followed by two well defined squarish spots (spots 12 and 13) and very faint phantom spot only rarely (spot 14); spot 10 obsolete or reduced to minute dot in some specimens; spot 11 half as large as spot 12, usually smaller in some specimens and inward of spots 12 and 13; fringes white with vein tips black.

Under surface of secondaries: black with costal margin and outer margin overscaled with white giving gray appearance in those areas; two narrow triangular white spots in costal area, outer one obsolete in some specimens; discal band indicated by lighter overscaling.

Abdomen: black above, dark brownish gray to black below. Thorax: gray with some brownish hairs above, darker below.

Palpus: white with few scales black tipped. Antenna: club above and below black, shaft ringed with white and black.

Length of forewing 27 mm to 34 mm, average 31.1 mm.

Male. Upper surface of primaries: black, similar to female with spots smaller and lighter in color; spot 4 usually one-half width of spot 2; spot 5 usually deeply concave outwardly, reduced to two lines of color along veins in some specimens; spot 6 narrow, one-half as wide as high; spots 7, 8 and 9 toothed inwardly; spots 7 and 8 with outer edge in straight line angled inwardly, spot 7 may or may not reach inner edge of spot 6; in some specimens spots 7 and 8 narrow, one-half as wide as high.

Under surface of primaries: similar to female with spots smaller; spots 2, 3, 4, 5 and 6 white; spots 1, 7, 8 and 9 light yellow.

Upper surface of secondaries: black with broad creamy yellow margin; black scaling along veins Cu_1 , Cu_2 and 2A, contrasting with margin.

Under surface of secondaries: black with costal margin and outer margin overscaled with white giving gray appearance in those areas; two white spots in costal area, inner one moderately large, triangular, outer one reduced to mere dot or obsolete in some specimens; discal band only faintly indicated by lighter overscaling most conspicuous in cell Cu_2 .

Abdomen, thorax, palpus and antenna same as in female.

Length of forewing 23 mm to 28 mm, average 25.5 mm.

DISCUSSION

This subspecies is distributed generally throughout central Arizona in an area roughly 50 miles wide by 200 miles long extending from southeast to northwest. In this area *navajo* is found in a variety of habitats and elevations, from the lower open desert country as is found along the Hughes Corral Road and at State Highway 188, through dense chaparral as is found on the lower slopes of Pinal Peak, and in spectacular rocky Pine-Juniper woodland as at the Storm Ranch locality. We have also found old larval tents and pupal skins in *Y. baccata* growing on the plateau above the town of Black Canyon, north of Sunset Point, Yavapai County. This area is relatively flat and the *Yucca* colony enormous, extending for miles to the northeast. In addition, we have one male collected in flight in Rackensack Wash near Camp Creek, Maricopa County, on 5 IV 1969, and one male collected in flight 2 miles south of Jerome, Yavapai County, on 4 IV 1970.

Throughout its range in central Arizona *navajo* is fairly constant in color and maculation. There is a distinct tendency among both sexes from all localities to exhibit a narrowing of the discal spot band on the upper surface of the primaries, and a reduction in size or obsolescence of spots 10 and 11 on the upper surface of the secondaries of the females. Size varied considerably within each sex but we did not attempt to correlate this with locality. The plate illustrates male and female phenotypes characteristic of the central Arizona population of *navajo*.

Of additional interest is the association of *navajo* with an undescribed subspecies of *Megathymus ursus* Poling, in which *Y. baccata* serves as the larval foodplant for each. In a later paper we will describe this *ursus* subspecies and attempt to clarify this association.

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